

Patent claims

1. A method for producing a lighting apparatus (10, 110, 210) with a polygonal luminous area, particularly a backlighting apparatus for a display, characterized in that the luminous area is put together in modular fashion from a plurality of individual polygonal luminous modules (1).
2. The method for producing a lighting apparatus as claimed in claim 1, characterized in that the luminous area is rectangular and is put together in modular fashion from a plurality of individual rectangular luminous modules (1).
3. The method as claimed in claim 1 or 2, characterized in that the luminous modules (1) are selected from a basic set of different-sized luminous modules.
4. The method as claimed in one of claims 1 to 3, characterized in that at least some of the plurality of luminous modules (1) have a light input part (3) with light emitting diodes (LEDs) (2).
5. The method as claimed in one of claims 2 to 4, characterized in that the basic set comprises:
a first luminous module of a first size, a second luminous module of a second size, a third luminous module, whose length corresponds to the length of the first luminous module (11) and whose width corresponds to the width of the second luminous module (21), and a fourth luminous module, whose length corresponds to the width of the first luminous module (11) and whose width

corresponds to the length of the second luminous module (21).

6. The method as claimed in one of claims 2 to 5,
5 characterized in that
the basic set of luminous modules comprises four
different-sized luminous modules (11, 21, 31, 41),
where

- 10 - the length of the diagonal of a first luminous
module (11) is an integer multiple of 1 inch and
the ratio of length to width of the luminous
module is preferably 4:3,
- 15 - the length of the diagonal of a second luminous
module (21), which is smaller than the first
luminous module, is an integer multiple of 1 inch
and the ratio of length to width of the luminous
module is preferably 4:3,
- 20 - the length of a third luminous module (31)
corresponds to the length of the first luminous
module (11) and the width of the third luminous
module (31) corresponds to the width of the second
luminous module (21), and
- 25 - the length of a fourth luminous module (41)
corresponds to the width of the first luminous
module (11) and the width of the fourth luminous
module (41) corresponds to the length of the
second luminous module (21).

7. The method as claimed in claim 6,
30 characterized in that
the length of the diagonal of the first luminous module
(11) is 7 inches and the length of the diagonal of the
second luminous module (21) is 5 inches.

35 8. The method as claimed in one of claims 1 to 7,
characterized in that
all of the luminous modules (1) have a light input part
(3) with light emitting diodes (LEDs) (2).

9. The method as claimed in one of claims 1 to 8,
characterized in that
external areas of the luminous modules which are not a
light exit area (6) or a light entry area (16) are at
least partly provided with a reflective coating (13).
10. The method as claimed in one of claims 1 to 9,
characterized in that
a luminous body (9) of the luminous module (1) is
provided whose cross section tapers as the distance
from the light input part (3) increases.
11. The method as claimed in one of claims 1 to 10,
characterized in that
the thickness of the luminous body next to the light
input part (3) is greater than the thickness of the
light input part, and a step (4) between the light
input part and the light exit area is in a form such
that the luminous modules (1) overlap, when put
together to form a luminous area, such that the light
input part (3) is covered by an adjacent luminous
module.
12. The method as claimed in one of claims 1 to 11,
characterized in that
a base area (7) opposite the light exit area has a
reflective structure which directs light emitted by the
LEDs during operation into the region of the step.
13. A lighting apparatus (10, 110, 210) with a
polygonal luminous area, particularly a backlighting
apparatus for a display,
characterized in that
the luminous area is made up in modular fashion from
individual polygonal luminous modules (1).
14. The lighting apparatus as claimed in claim 13,

characterized in that
the luminous area is rectangular and is made up of
individual rectangular luminous modules (1).

5 15. The lighting apparatus as claimed in claim 13 or
14,
characterized in that
the luminous modules (1) are selected from a basic set
of different-sized luminous modules (11, 21, 31, 41).

10 16. The lighting apparatus as claimed in one of claims
13 to 15,
characterized in that
at least some of the plurality of luminous modules (1)
15 have a light input part (3) with light emitting diodes
(LEDs) (2).

17. The lighting apparatus as claimed in one of claims
14 to 16,
20 characterized in that
the basic set comprises:
a first luminous module of a first size, a second
luminous module of a second size, a third luminous
module, whose length corresponds to the length of the
25 first luminous module (11) and whose width corresponds
to the width of the second luminous module (21), and a
fourth luminous module, whose length corresponds to the
width of the first luminous module (11) and whose width
corresponds to the length of the second luminous module
30 (21).

18. The lighting apparatus as claimed in one of claims
14 to 17,
characterized in that
35 the basic set of luminous modules comprises four
different-sized luminous modules (11, 21, 31, 41),
where
- the length of the diagonal of a first luminous

module (11) is an integer multiple of 1 inch and the ratio of length to width of the luminous module is preferably 4:3,

- 5 - the length of the diagonal of a second luminous module (21), which is smaller than the first luminous module, is an integer multiple of 1 inch and the ratio of length to width of the luminous module is preferably 4:3,
- 10 - the length of a third luminous module (31) corresponds to the length of the first luminous module (11) and the width of the third luminous module (31) corresponds to the width of the second luminous module (21), and
- 15 - the length of a fourth luminous module (41) corresponds to the width of the first luminous module (11) and the width of the fourth luminous module (41) corresponds to the length of the second luminous module (21).

20 19. The lighting apparatus as claimed in claim 18, characterized in that
the length of the diagonal of the first luminous module (11) is 7 inches and the length of the diagonal of the second luminous module (21) is 5 inches.

25 20. The lighting apparatus as claimed in one of claims 13 to 19, characterized in that
all of the luminous modules (1) have a light input part
30 with light emitting diodes (LEDs) (2).

21. The lighting apparatus as claimed in one of claims 13 to 20, characterized in that
35 external areas of the luminous modules which are not a light exit area (6) or a light entry area (16) are at least partly provided with a reflective coating (13).

22. The lighting apparatus as claimed in one of claims 13 to 21,

characterized in that

5 a luminous body (9) of the luminous module (1) is provided whose cross section tapers as the distance from the light input part increases.

23. The lighting apparatus as claimed in one of claims 13 to 22,

10 characterized in that

the thickness of the luminous body next to the light input part (3) is greater than the thickness of the light input part, with a step (4) being in a form such that the luminous modules (1) overlap, when put
15 together to form a luminous area, such that the light input part (3) is covered by the adjacent luminous module.

24. The lighting apparatus as claimed in one of claims 13 to 23,

20 characterized in that

a base area (7) opposite the light exit area has a reflective structure which directs light emitted by the LEDs during operation into the region of the step.

Abstract

Method for producing a lighting apparatus, and lighting apparatus

The luminous area of a lighting apparatus 10, 110, 210 with a rectangular luminous area is made up modular fashion from individual rectangular luminous modules 1. The basic set comprises a first luminous module 11 of a first size, a second luminous module 21 of a second size, a third luminous module 31, whose length corresponds to the length of the first luminous module 11 and whose width corresponds to the width of the second luminous module 21, and a fourth luminous module 41, whose length corresponds to the width of the first luminous module 11 and whose width corresponds to the length of the second luminous module 21. By combining the luminous modules it is possible to produce backlighting for a multiplicity of display sizes.

Figure 2